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ABSTRACT

In 1991, the Worcester (Massachusetts) Public Schools received a grant to provide services to maintain the early benefits attained by Head Start children. One part of the program is advancement of a developmentally appropriate curriculum. A study was undertaken to examine the effects of investing substantial resources in classrooms in four schools in economically impoverished areas. A "tailor-made" developmentally appropriate curriculum was developed, field-tested, and approved in 1993 for the demonstration classrooms. A 2-year comparison of the demonstration and observation (or control) classrooms was then undertaken to assess the differences in creating developmentally appropriate classrooms. A classroom observation instrument that examines developmental practice was used for observation, and data were analyzed resulting in five scales plus a composite scale. Analysis of data showed that, especially for the first year and to a lesser degree the second year, the demonstration classrooms, which received considerable resources, were further advanced in providing a developmentally appropriate environment for children than the comparison classrooms, which did not receive resources. Overall, the study suggests that focused intervention of resources encourages a more developmentally appropriate classroom environment. Contains 11 references. (TM)

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Transition Project - Early Childhood Classrooms

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Abstract

The Worcester Public Schools, Worcester, MA received a grant from the U.S. Department of Health and Human Services, to provide services to maintain the early benefits attained by Head Start children. One component of the program is the advancement of a developmentally appropriate curriculum. This study examines the differences between demonstration and comparison classrooms during a two year period. A classroom observation instrument was used for observations. From the analysis of data in Year 1 and Year 2, there is evidence to support the hypothesis that the demonstration school classrooms, which received considerable resources to create developmentally appropriate classrooms, are further advanced in providing a developmentally appropriate environment for children than the comparison schools, which did not receive these resources.

Introduction

In October 1991, the Worcester Public Schools, Worcester, MA was awarded a National Head Start-Early Childhood Transition grant from the U.S. Department of Health and Human Services, Administration on Children, Youth and Families, to test the hypothesis that the provision of a continuous program of comprehensive services (including parent involvement, social services, cognitive development, health, and nutrition), starting in kindergarten and continuing through third grade, will maintain and enhance the early benefits attained by Head Start children and their families. One component of the service package in this project is the advancement of a developmentally appropriate curriculum, and considerable resources have been invested in this area. This presentation focuses on the results of these efforts and examines the differences between schools and classrooms, which have served as demonstration and comparison settings for the study, during a two year period. A classroom observation instrument, which examines developmental practice, was used for observation purposes. It was hypothesized that the Transition demonstration school classrooms are further advanced in providing a developmentally appropriate curriculum to students than the comparison school classrooms. This study examines the effects of investing substantial resources in classrooms in economically impoverished areas and may have further generalizability to other classrooms in similarly impoverished areas.

Developmentally Appropriate Curriculum

The idea of a developmentally appropriate curriculum is grounded in a philosophy of education, based on research by Bruner (1960), Chomsky (1972), Dewey (1938), Erikson (1963), Gardner (1983), Kohlberg (1981), and Piaget (1970). This research supports a curriculum with adults interacting with children at each child's existing level of development, using appropriate activities and materials. It also supports a learning environment which is child-centered.

A developmentally appropriate curriculum can be described as a "curriculum that is appropriate for the child's age and all areas of the individual child's development, including educational, physical, emotional, social, cognitive, and communication" (Federal Register, 1991, p. 31819).

Formulating a Developmentally Appropriate Curriculum

To comply with the Federal guidelines for the Transition Project that require the implementation of a developmentally appropriate curriculum in the respective classrooms of the demonstration schools beginning in September 1992, a curriculum consultant was hired in January 1992 to serve as the facilitator of a process that would lead to the development of a new curriculum for the project schools. A curriculum committee was convened later that January, consisting of forty members including teachers, administrators, a Chapter 1 Head Teacher, an Early Childhood Teacher Trainer, and several parents. A conscious decision was

made to write a curriculum, rather than adopt one such as High Scope, so that it would be 'tailor-made' to meet the needs of the district. From January to August of 1992 the committee, under the direction of the curriculum consultant, completed the Philosophy, Goals, Developmental Characteristics, Math and Literacy sections. Four committees were then developed to write the respective sections of Science, Physical Development, Art & Music, and Social Studies. After field-testing the curriculum for the first full year of the program, the school committee gave their unanimous approval of the curriculum in October 1993.

The formulation and writing of the developmentally appropriate curriculum functioned as a powerful staff development and training endeavor, with the end-products being a curriculum and a group of teachers with a strong investment in the implementation of this curriculum.

Classroom Resources

In accordance with the specifications for a developmentally appropriate classroom, the Transition demonstration schools were given considerable resources, including training and materials. A faculty/staff development plan was established and implemented based on a survey assessing their needs and interests. During the first two years, monthly in-service training was provided to classroom teachers. An annual allocation of funds was made available to demonstration site teachers to purchase materials that support the developmentally appropriate curriculum.

In addition, the classroom teachers worked in cooperation with the Transition Project Parent Room staff to assist parents in understanding the classroom environment and the meaning of a developmentally appropriate curriculum and classroom. This collaboration also became a means of furthering and reinforcing the faculty development function in relation to developmentally appropriate practice.

Method

Research Design

The research design for this study includes four schools randomly assigned to the demonstration cluster and four schools randomly assigned to the comparison cluster. All schools are Chapter 1 school-wide projects with poverty levels of 75% or greater.

At the time of the proposal for funding for this project, the eight participating schools were approximately equivalent or comparable. The eight schools were then randomly assigned as demonstration and comparison schools. However, since that time, beginning in September 1992, two of the original comparison schools changed from typical neighborhood schools to magnet schools. These two schools have had an immense investment of resources from sources other than the Transition Project. Thus, two of the four comparison schools are not comparable to the demonstration schools or to the other two comparison schools. Because of this situation, it has been necessary to analyze the data in a different manner

than simply looking at differences between the demonstration and comparison school populations. All analysis has, therefore, been done using both a traditional model of demonstration/comparison group differences, as well as using a different approach - a demonstration/comparison1/comparison2 model of analyzing group differences. In this presentation, comparison1 refers to the two comparable comparison schools, and comparison2 refers to the two comparison schools which have received special resources, based on their status as magnet schools.

Sample

At the end of the first year of program implementation (Spring 1993), 25 kindergarten classrooms in the four demonstration and four comparison schools were observed using the Assessment Profile for Early Childhood Programs: Research Version (Abbott-Shim & Sibley, 1992). At the end of the second year of program implementation (Spring 1994), 23 kindergarten classes and 25 first grade classrooms in the demonstration and comparison schools were observed using the same instrument.

Instrument

The Assessment Profile for Early Childhood Programs: Resea ch Version (Abbott-Shim & Sibley, 1992) includes 87 criteria, organized into five scales: (a) Learning Environment, (b) Scheduling, (c) Curriculum, (d) Interacting, and (e) Individualizing. Each criterion is scored as "yes", if observed,

and "no", if not observed. Data are collected through observation of the classroom, interview with the teacher, and review of documents.

The Assessment Profile for Early Childhood Programs Research Manual (Abbott-Shim, Sibley, & Neel, 1992) provides the following descriptions of each Scale. The Learning Environment Scale focuses on the accessibility of a variety of learning materials to children in the classroom. Variety is assessed across conceptual areas and within each conceptual area. The Scheduling Scale assesses the written plans for classroom scheduling, as well as the implementation of classroom activities. The Curriculum Scale measures the variety of teaching techniques used to facilitate learning and the individualization of learning activities based on the teacher's assessment of children in the class. It also examines the opportunities for children to guide their own learning and the role of the teacher in fostering multicultural awareness, learning, and appreciation. The Interacting Scale assesses the interactions between the teacher and children. This scale focuses on the teacher's initiation of positive and verbal interactions, responsiveness to children, and the behavior management approach. The Individualizing Scale assesses the teacher's implementation and use of systematic and comprehensive child assessment in planning and organizing learning experiences that match the skill level of each child.

The validity of the Assessment Profile has been established through content validity and criterion validity (Abbott-Shim,

Sibley, & Neel, 1992). To establish content validity, determining the degree to which the instrument depicts high quality early childhood classrooms and teaching practices, the authors of the instrument conducted a thorough review of the early childhood/child development literature, and had the instrument reviewed by numerous professionals, including early childhood trainers, program administrators, teachers, resource and referral staff, and professors of early childhood education. The instrument was field-tested in 90 child care centers and was used for program evaluation over a period of ten years. The Assessment Profile was also compared with the Accreditation Criteria of the National Association for the Education of Young Children, which gives some nationally recognized standards for high quality, early childhood, developmentally appropriate practices. There was a 100% match in the criteria between the two measures.

The Assessment Profile has also been used in criterion related validity studies along with The Early Childhood Environment Rating Scale, a scale containing 37 items across 7 sub-scales, which has been used to determine the quality of care in early childhood programs. Moderate to good correlations have been found in these studies, with one study showing a significant overall correlation ($r=.74$, $p=.000$).

Reliability of the Assessment Profile has been reported by scale for Classical Measurement Theory Reliability using Cronbach's Alpha and Spearman-Brown corrected split-halves formula, and for

Item Response Theory Reliability. The scale reliabilities are high, ranging from .79 to .99.

Classroom Observation Procedures

The classroom observation protocol is organized in such a way that classrooms in a school are observed on the same day on a rotating basis. The classrooms are visited on a 15-minute rotating cycle for 4 rotations, to get a sampling or "snapshot" of each classroom at different times of the day. Approximately one hour of time is spent in each classroom.

In this study the classroom observations were performed by two observers. During Year 1, both observers were present together in the same classrooms during the same times, and recorded individual responses to the instrument items. The observers then discussed any items in the instrument where there was disagreement. During Year 2, Observer 1 observed all first grade classrooms and Observer 2 observed all kindergarten classrooms.

Observer Reliability

Before the commencement of data gathering for this study, the two observers worked together in training/piloting situations and established strong reliability levels ($r > .90$). Also, during Year 1, when the observers worked together in all classrooms, there was a high level of reliability in the observations ($r = .96$).

Results

The results of the 'Assessment Profile for Early Childhood Programs' were analyzed by creating an individual scale score for each of the five scales on the instrument: (1) Learning Environment, (2) Scheduling, (3) Curriculum, (4) Interacting, and (5) Individualizing, and by creating a total composite score including all five scales. Analysis of variance was performed by demonstration/comparison1/comparison2, as well as multiple comparison tests using Tukey (p of .05) and Scheffe (p of .01) tests.

Year 1 Data

Analysis of the 'Assessment Profile for Early Childhood Programs' for Year 1, Spring 1993, was performed using twenty-five (25) Cohort 1 kindergarten classrooms in the eight demonstration and comparison schools. Table 1 shows the mean and standard deviation scores for the individual scales, as well as the Total Composite scores for demonstration, comparison1, and comparison2 groups. Table 2 shows the results of the Analysis of Variance and Multiple Comparison Tests. Results on this first year data show that on the Total Composite Score, the Learning Environment Scale, the Scheduling Scale, and the Curriculum Scale statistically significant differences ($p < .05$ or $p < .01$) were found between the demonstration and comparison1 classrooms and between comparison1 and comparison2 classrooms. All of these Total or Scale scores showed demonstration and comparison2 classrooms with higher scores,

as predicted, except the Scheduling Scale, which showed comparison1 classrooms with the highest score. It appears that classrooms with higher scores, representing more developmental practices, tended not to have posted schedules, which accounted for a large portion of this scale. On the Interacting Scale, no statistically significant differences were found between any two groups. On the Individualizing Scale, although comparison2 and demonstration classrooms scored higher than comparison1 classrooms, statistically significant differences were found only between demonstration and comparison2 groups and comparison1 and comparison2 groups.

The scores for the Total Composite, the Learning Environment Scale, and the Curriculum Scale were in the predicted direction. Statistically significant differences were found between demonstration school classrooms and comparison1 school classrooms, as well as between comparison2 school classrooms and comparison1 school classrooms.

Year 2 Data

Analysis of the 'Assessment Profile for Early Childhood Programs' for Year 2, Spring 1994, was performed with 23 kindergarten classes (Cohort 2) and 25 first grade classrooms (Cohort 1) in the demonstration and comparison schools.

Cohort 1 - Grade 1 Classes

Table 3 shows the mean and standard deviation scores for the individual scales, as well as the Total Composite scores for

demonstration, comparison1, and comparison2 groups in Grade 1 classrooms. Table 4 shows the results of the Analysis of Variance and Multiple Comparison Tests. The mean scores of the Total Composite Score, the Learning Environment Scale, the Curriculum Scale, and the Individualizing Scale, are greater for the demonstration and comparison2 classrooms than for comparison1 classrooms, similar to the results for Year 1; however, these differences are not statistically significant.

Cohort 2 - Kindergarten Classes

Table 5 shows the mean and standard deviation scores for the individual scales, as well as the Total Composite scores for demonstration, comparison1, and comparison2 groups in kindergarten classrooms. Table 6 shows the results of the Analysis of Variance and Multiple Comparison Tests. Although the Learning Environment Scale and the Curriculum Scale are higher for the demonstration and comparison2 classrooms than the comparison1 classrooms, there are no statistically significant differences. Only the Scheduling Scale shows statistically significant differences, but again in the inverse direction. Comparison1 classrooms score high, whereas demonstration and comparison2 classrooms score lower.

In comparing the mean and standard deviation scores for the kindergarten classes in Year 2 with their scores in Year 1, it should be noted that the mean scores for all groups -- demonstration, comparison1 and comparison2 -- have increased; however, the comparison1 classrooms have increased substantially

more. This large increase on the part of the comparison1 classrooms reduces the significant differences between groups that was evident in Year 1.

Combined Results - Kindergarten and Grade 1

A combined analysis of kindergarten and first grade data for Year 2 was performed in order to examine any overall/combined differences between the classrooms in each analysis group. These results are shown in Tables 7 and 8. Table 7 shows the mean and standard deviation scores for the individual scales, as well as the Total Composite scores for demonstration, comparison1, and comparison2 groups in kindergarten and first grade classrooms. Table 8 shows the results of the Analysis of Variance and Multiple Comparison Tests. On the Total Composite score, the Learning Environment Scale and the Curriculum Scale, again, the demonstration and comparison2 classrooms scored higher than the comparison1 classrooms; however, most of the differences were not statistically significant. There were statistically significant differences between the comparison1 and comparison2 classrooms on the Learning Environment Scale and the Scheduling Scale, and between comparison2 and demonstration classrooms, as well as, between comparison2 and comparison1 classrooms on the Individualizing Scale.

Discussion

Limitations of the Study

The major limitation of the study is the small sample size, particularly in comparison1 and comparison2 groups. This is a disadvantage when performing Analysis of Variance tests on the data. With a small sample size, differences between groups often do not appear to be statistically significant. With much of the Year 2 data presented, the trends of difference between group means continue, similar to the Year 1 data, however, they do not show statistical significance. This may be due, in part, to the very small number of classrooms being compared.

Conclusions

From the analysis of data from the classroom observations in Year 1 and Year 2, there is evidence, particularly in Year 1, and to a lesser degree in Year 2, to support the hypothesis that the demonstration school classrooms, which received considerable resources to create developmentally appropriate classrooms, are further advanced in providing a developmentally appropriate environment for children than the comparison schools, which did not receive these resources. A consequence of the modification in the research design from the original demonstration/comparison group design and hypothesis to the new formulation using a demonstration/comparison1/comparison2 design for analysis, provided the means to differentiate the two comparison groups into

comparison1 and comparison2, based on the input of resources into these schools, and to examine similarities and differences among the three groups. On the other hand, the necessity of separating the comparison group into comparison1 and comparison2 groups, has generated very small n's, and has perhaps created the predicament of few statistically significant differences, particularly on the Learning Environment Scale, the Curriculum Scale, and the Total Composite scores.

The substantial increase in scores for comparison1 classrooms, along with a more modest increase in scores for demonstration and comparison2 classrooms, is rather difficult to explain. However, there are some possible explanations. First, during Year 1, the comparison1 kindergarten classrooms in one school were in temporary quarters, due to repairs which were made to the building. During this time they did not have their usual space or materials. In Year 2, however, these kindergarten classrooms were back in their permanent quarters with their materials. Second, during Year 2, this school also experienced a new principal. Third, because of the recent societal trend in early childhood education toward more developmentally appropriate classrooms, some workshops and resources are offered to teachers in all of the Worcester Public Schools, although not to the same degree as in the Transition and Comparison2 schools. Thus, the comparison1 teachers, although not receiving intense training in developmental practices, may be influenced marginally by the trends in early childhood education.

Implications for Intervention

Based on this study, there is some evidence that the focused investment of resources in school classrooms reflects in the individual classroom curriculum approach, and encourages a more developmentally appropriate classroom environment. These developmental practices take into consideration age-appropriate activities, as well as the individual child's development, interests, and cultural background. This model of service provision -- the investment of resources, including training and materials, to develop and maintain developmentally appropriate classroom environments in economically impoverished areas -- may improve the quality of education and better meet the needs and interests of children in these areas. There are, thus, implications from this study for the generalizability of the Transition Project model of advancing a developmentally appropriate curriculum.

Table 1

Classroom Observations - Year 1 - Spring 1993
Cohort 1 - Kindergarten

	Total (n=25)	Demonstration (n=12)	Comparison1 (n=5)	Comparison2 (n=8)
TOTAL COMPOSITE				
mean	73.64	76.58	47.80	85.38
sd	21.36	8.23	23.19	22.39
LEARNING ENVIRONMENT				
mean	31.00	34.25	12.40	37.75
sd	13.17	3.79	13.18	15.80
SCHEDULING				
mean	5.68	5.00	8.60	4.87
sd	2.30	0.00	4.28	0.35
CURRICULUM				
mean	13.80	14.67	9.00	15.50
sd	3.99	2.87	2.65	4.07
INTERACTING				
mean	11.56	11.83	9.00	12.75
sd	3.93	4.30	3.81	3.01
INDIVIDUALIZING				
mean	11.60	10.83	8.80	14.50
sd	2.52	2.52	2.17	2.20

Table 2

Classroom Observations - Year 1 - Spring 1993
Cohort 1- Kindergarten
Levels of Significance of Analysis of Variance
BY SCALE SCORE

	Demonstration	Comparison1	Comparison2
Total Composite Score			
Demonstration	---	$p < .05$	---
Comparison1	---	---	---
Comparison2	---	$p < .01$	---
Learning Environment			
Demonstration	---	$p < .01$	---
Comparison1	---	---	---
Comparison2	---	$p < .01$	---
Scheduling			
Demonstration	---	$p < .01$	---
Comparison1	---	---	---
Comparison2	---	$p < .01$	---
Curriculum			
Demonstration	---	$p < .05$	---
Comparison1	---	---	---
Comparison2	---	$p < .01$	---
Interacting			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Individualizing			
Demonstration	---	---	$p < .01$
Comparison1	---	---	$p < .01$
Comparison2	---	---	---

Table 3

Classroom Observations - Year 2 - Spring 1994
Cohort 1 - Grade 1

	Total (n=25)	Demonstration (n=12)	Comparison1 (n=5)	Comparison2 (n=8)
TOTAL COMPOSITE				
mean	69.30	73.08	46.80	80.50
sd	23.92	18.47	14.27	30.22
LEARNING ENVIRONMENT				
mean	25.92	28.67	11.00	31.13
sd	14.93	12.84	6.04	16.79
SCHEDULING				
mean	6.35	7.00	6.60	4.83
sd	3.31	4.24	4.16	0.41
CURRICULUM				
mean	14.32	15.00	10.80	15.00
sd	4.24	2.09	4.97	2.09
INTERACTING				
mean	12.04	12.00	10.80	12.88
sd	2.92	2.66	0.84	3.98
INDIVIDUALIZING				
mean	11.56	10.42	7.60	15.75
sd	3.81	1.88	2.88	2.43

Table 4

Classroom Observations - Year 2 - Spring 1994
Cohort 1- Grade 1
Levels of Significance of Analysis of Variance
BY SCALE SCORE

	Demonstration	Comparison1	Comparison2
Total Composite Score			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	$p < .05$	---	---
Learning Environment			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	$p < .05$	---	---
Scheduling			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Curriculum			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Interacting			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Individualizing			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	$p < .01$	$p < .01$	---

Table 5

Classroom Observations - Year 2 - Spring 1994
Cohort 2 - Kindergarten

Comparison2	Total (n=23)	Demonstration (n=11)	Comparison1 (n=5)	(n=7)
TOTAL COMPOSITE				
mean	86.00	78.45	83.00	90.57
sd	15.23	11.33	14.97	21.25
LEARNING ENVIRONMENT				
mean	38.35	39.18	32.20	41.43
sd	12.15	9.60	6.49	17.77
SCHEDULING				
mean	6.04	4.82	10.20	5.00
sd	3.04	0.40	4.76	0.00
CURRICULUM				
mean	14.91	15.00	13.40	15.86
sd	3.55	3.46	2.19	4.49
INTERACTING				
mean	12.78	12.09	13.20	13.57
sd	2.84	3.56	2.49	1.62
INDIVIDUALIZING				
mean	13.91	13.36	14.00	14.71
sd	2.94	3.11	3.94	1.98

Table 6

Classroom Observations - Year 2 - Spring 1994
Cohort 2 - Kindergarten
Levels of Significance of Analysis of Variance
BY SCALE SCORE

	Demonstration	Comparison1	Comparison2
Total Composite Score			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Learning Environment			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Scheduling			
Demonstration	---	---	---
Comparison1	$p < .01$	---	$p < .01$
Comparison2	---	---	---
Curriculum			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Interacting			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Individualizing			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---

Table 7

Classroom Observations - Year 2 - Spring 1994
Cohort 1,2 - Combined Kindergarten and Grade1

	Total (n=48)	Demonstration (n=23)	Comparison1 (n=10)	Comparison2 (n=15)
TOTAL COMPOSITE				
mean	77.65	78.52	64.90	85.92
sd	21.55	16.20	23.54	25.17
LEARNING ENVIRONMENT				
mean	31.88	33.70	21.60	35.93
sd	14.91	12.38	12.64	17.45
SCHEDULING				
mean	6.20	5.96	8.40	4.92
sd	3.30	3.21	4.62	0.27
CURRICULUM				
mean	14.60	15.00	12.10	15.67
sd	3.90	2.76	3.87	4.83
INTERACTING				
mean	12.40	12.04	12.00	13.20
sd	2.88	3.05	2.16	3.03
INDIVIDUALIZING				
mean	12.69	11.83	10.80	15.27
sd	3.59	2.90	4.69	2.22

Table 8

Classroom Observations - Year 2 - Spring 1994
Cohort 1,2 - Combined Kindergarten and Grade 1
Levels of Significance of Analysis of Variance
BY SCALE SCORE

	Demonstration	Comparison1	Comparison2
Total Composite Score			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Learning Environment			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	$p < .05$	---
Scheduling			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	$p < .05$	---
Curriculum			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Interacting			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	---	---	---
Individualizing			
Demonstration	---	---	---
Comparison1	---	---	---
Comparison2	$p < .05$	$p < .05$	---

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